

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

1

reserve

F7692Pr

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

FOREST PRODUCTS LABORATORY
PREFABRICATED WOOD HOUSE SYSTEM

APRIL 5, 1935

UNITED STATES
DEPARTMENT OF AGRICULTURE
LIBRARY



Reserve

BOOK NUMBER 1
796217 F7692Pt

796217

An Experimental System of All-Wood Unit Construction

THE HOUSE here shown is a basic example of a system of prefabricated all-wood construction developed in line with modern structural research and modern wood fabrication. It represents new methods of manufacture and assembly that are practicable only under the industrial order of the present and future; it is NOT suitable for production by ordinary carpentry in the traditional manner.

In other words, the system is based on the use of standard units, sections, or panels to be made in large quantities by factory methods and then assembled quickly and without waste on the site. Its ultimate success will depend on close technical control in production, accurate dimensions of units, and efficient painting practice to insure lasting weatherproof service.

Neither this house as shown nor any other like it is on the market today. It is an experiment indicating a logical next development in the nationwide housing movement, and it illustrates possibilities which industrialized wood-fabrication has to offer in economical and efficient home building.

THE UNIT PANELS of which the house is built are all of the same width, approximately four feet. In length they range from 8 to 14 feet. All utilize the "stressed covering" principle, so successfully applied in aircraft construction to secure strength and lightness; that is, plywood sheets forming the panel faces are glued to both sides of the structural framing and thus become a definite part of the load-carrying system instead of being a dead load on the supports as in ordinary nailed construction. In this way the framing members can be materially lightened without any sacrifice of strength or rigidity. For example, the depth of the joists in the floor panels has been reduced from the conventional 10 inches to 6 inches.

The roof panels, to insure ample strength and permanent alignment, are of the same construction as the floor panels in the present design, but are made two feet longer to provide for overhang at

the eaves. The sides of the floor and roof panels are recessed and splined to secure a strong interlocking fit with adjacent units.

The wall panels, by utilizing effectively the strength of the exterior and interior plywood, need to be less than 2 inches thick instead of the customary wall thickness of 6 to 8 inches. Secure but easy-fitting joints are provided by upright mullions with double grooves to receive the edges of the inner and outer plywood.

The standard unit wall panels are of four main types. Doors and high and low windows are carried in three types, while the other type, for both exterior and partition walls, is plain. All panels are insulated against sound as well as heat and cold, and all necessary electrical wiring and outlets for servicing the house are built into the units. The entire system is being developed with a view to quick and ready final assembly on the site with a minimum of tool work and without cutting or trimming.

THE FINISHED FLOORS of the house are prefabricated. The small pieces of which they are made are factory-produced and assembled on 4-foot squares of plywood, so that all that remains to be done on the site is to lay them in place and secure them to the floor panels by means of the parting strips which surround each square. The bathroom floor is a new wood product under development at the Forest Products Laboratory. Maple sawdust, chemically treated, is molded under pressure to form a dense, black, impervious plastic. Discs 4½ inches in diameter, the largest size made with present experimental equipment, are machined into hexagons and squares to form the main body of the floor and its border. In quantity production the whole floor would undoubtedly be molded from this plastic in a single unit.

FLEXIBILITY OF DESIGN. The fact that the house is made up of standard parts does not mean that any two houses so built must be identical in design and appearance. By interchanging various units, different conditions can be met; for instance, if the orientation of the house were different,

another totally different floor plan could be used, windows could be moved to other locations, roof design could be altered, and entrances could be placed to suit the requirements of the site. The use of standard factory-made parts does not mean standard house units identical in every part, but it offers the possibility for individuals to have individual houses at lower cost than is possible today. Industrialization of house building merely substitutes wall, floor, and roof panels for timbers, boards, and shingles.

A HOME FOR COUNTRY OR CITY. The adaptability of the all-wood sectional house system to construction in any region and at any time of the year is a special advantage. The plastering problem is definitely eliminated. There is no waiting for plaster to dry, no warping of woodwork from lurking dampness, and no network of plaster cracks to enmesh the interior year by year. The interior lends itself to any scheme of decoration and furnishing that owners may demand—plain or ornate, modernistic or conventional. The present treatment, under the direction of the Related Art Department of the home economics faculty of the University of Wisconsin, offers many suggestions for comfort and attractive appearance of the home that are well within the reach of families of moderate means.

Conveniences and service features would, in general, be designed with an eye to compactness and proper over-all dimensions. The clothes closets as shown are made in ready-built units and need only be fastened in place. Kitchen cabinets and shelving have also been designed as part of the house, but suitable equipment of this type is readily obtainable on the market in any size or make desired. The plumbing, heating, and electrical equipment seen in the house are commercial installations illustrating close use of available space.

Although the work has not yet progressed sufficiently far to permit advance announcement of costs or to warrant hasty commercialization of this particular structural system, there is little reason to doubt that such a house is potentially susceptible of mass production at lower costs than current practice permits.

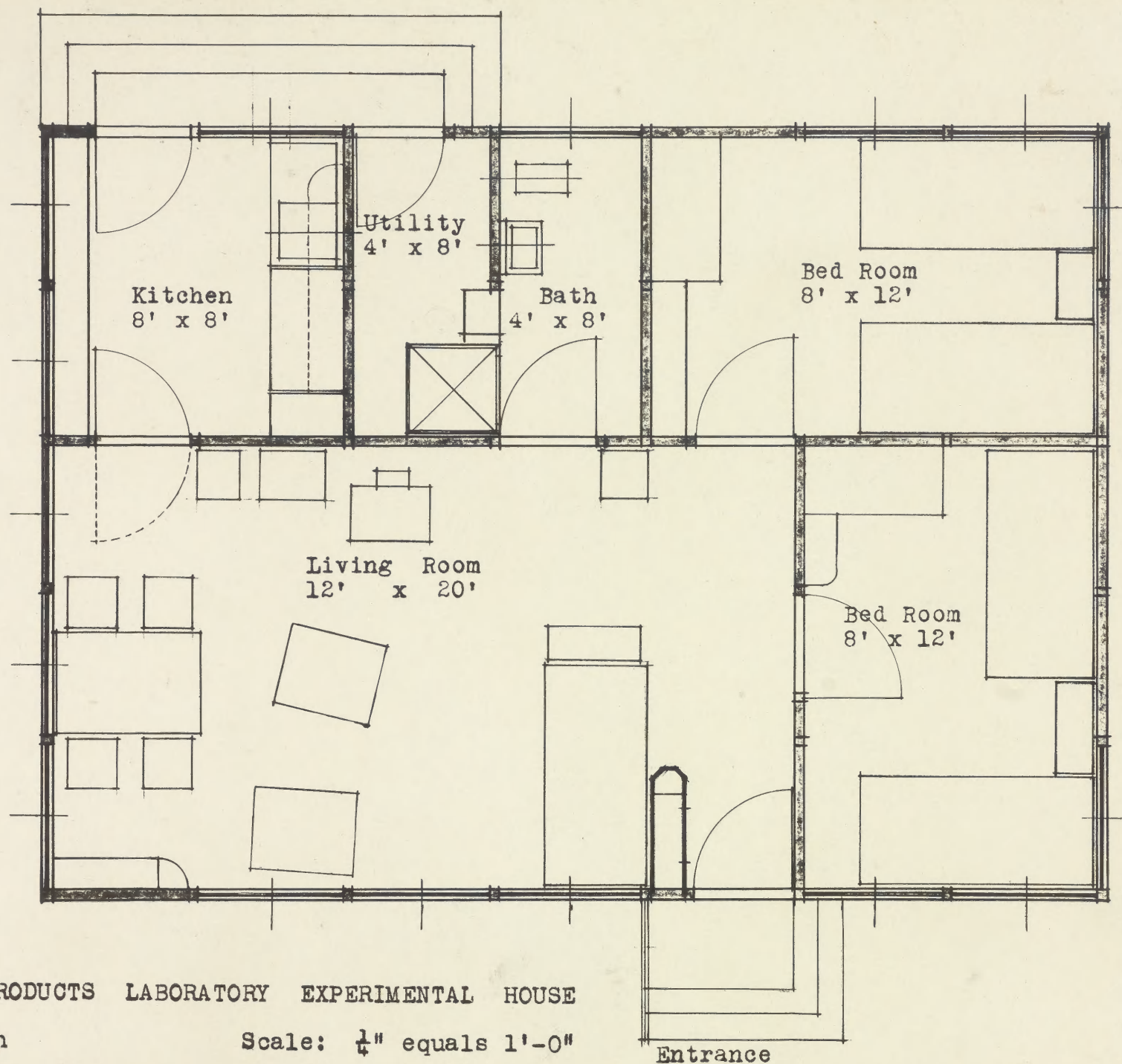




FOREST PRODUCTS LABORATORY EXPERIMENTAL ALL WOOD HOUSE

Erected to demonstrate a fundamentally new system of house prefabrication now under development at the Laboratory; to determine methods and facility of assembling new wood structural units into a completed house; and, through the experience gained in erecting a full scale model, to give direction to future research.

North



FOREST PRODUCTS LABORATORY EXPERIMENTAL HOUSE

Floor Plan

Scale: $\frac{1}{4}$ " equals 1'-0"

M 25512 F

A very simple plan of four rooms and bath with the plumbing concentrated in a small utility room placed between the bath and kitchen. The shower stall sets back into the utility room.

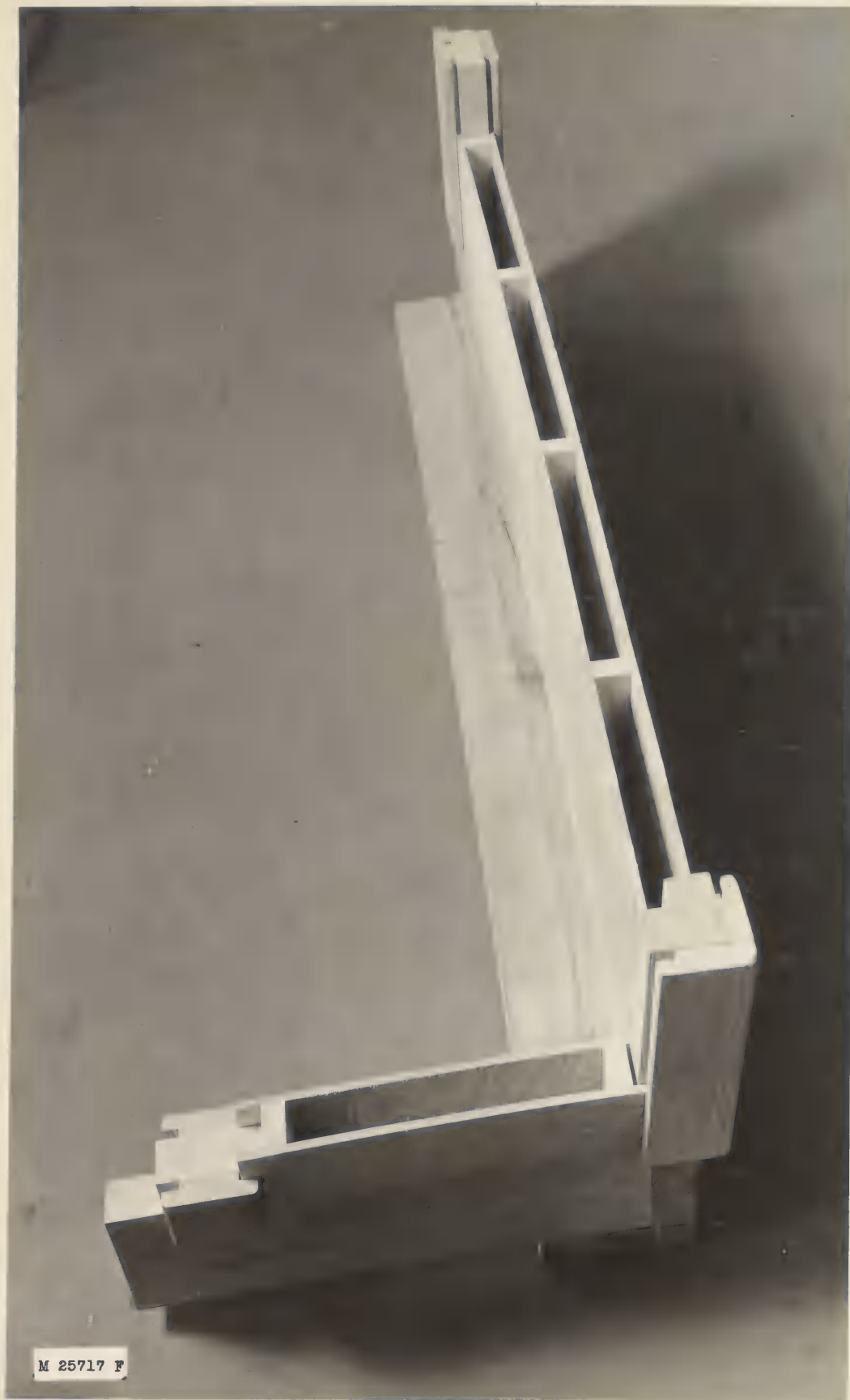


Five trucks bring everything to the site; this includes plumbing fixtures, heating stove, kitchen cabinets, and bedroom wardrobes.



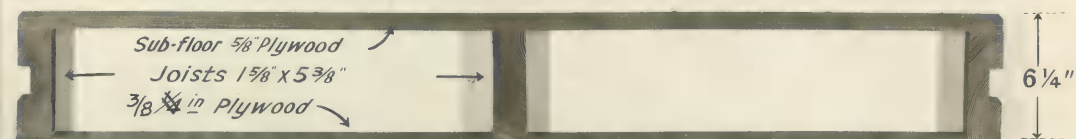
The prefabricated units stacked ready for assembly. Total volume ready for truckage is about 2,500 cubic feet.





M 25717 F

Section showing wall units and how they fit into vertical mullions at corners and between panels.



Cross section of floor and roof panels. Grooves in the outside joists are for splines between adjacent panels.



Placing floor panels. Splines are put between adjacent panels.





The temporary foundation is erected, squared, and leveled and all floor panels laid in three hours.



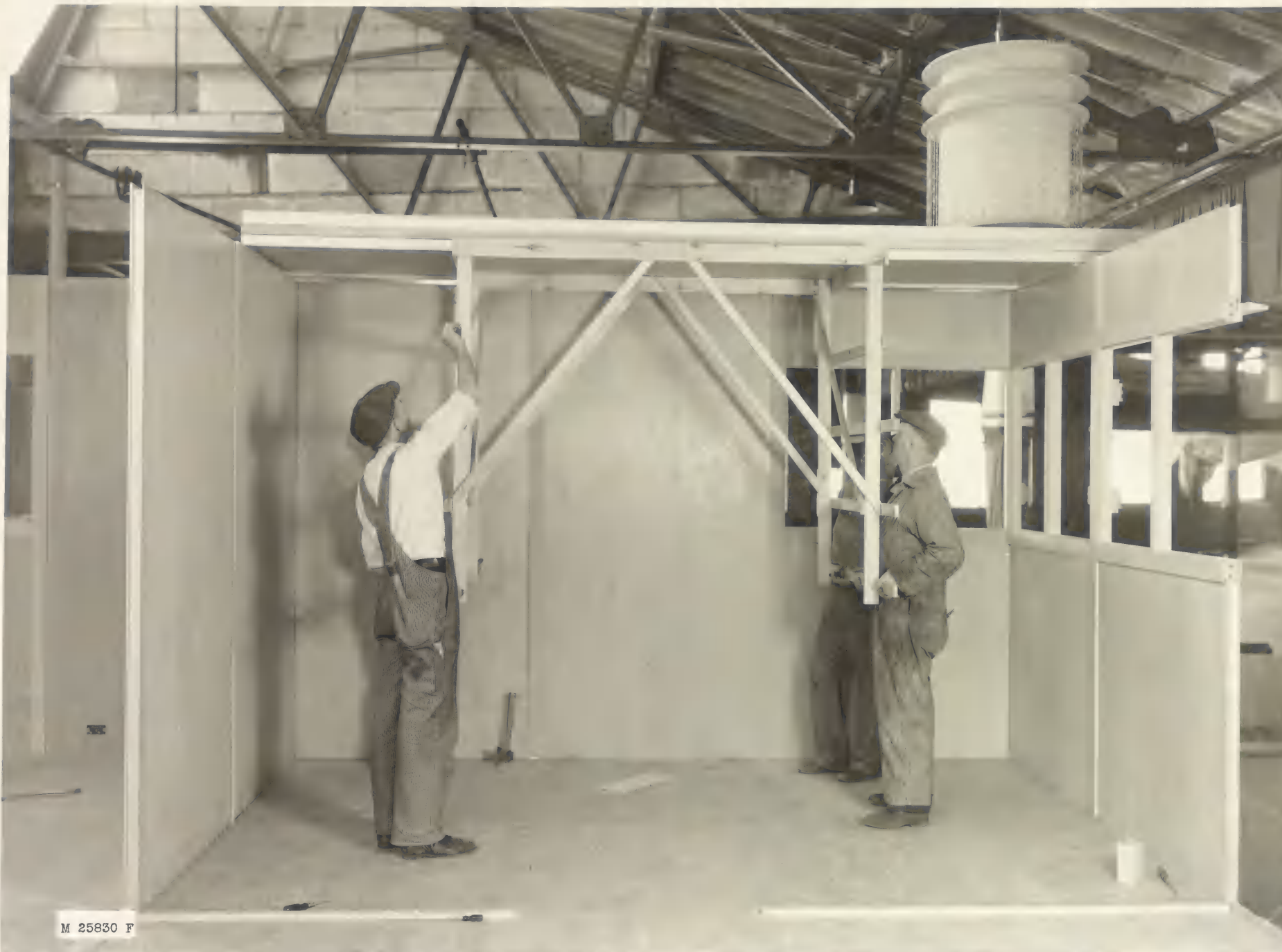
Placing the first wall units. The plywood panels above and below the window frames fit into the corner post and dowels are also provided at the window header and sill.



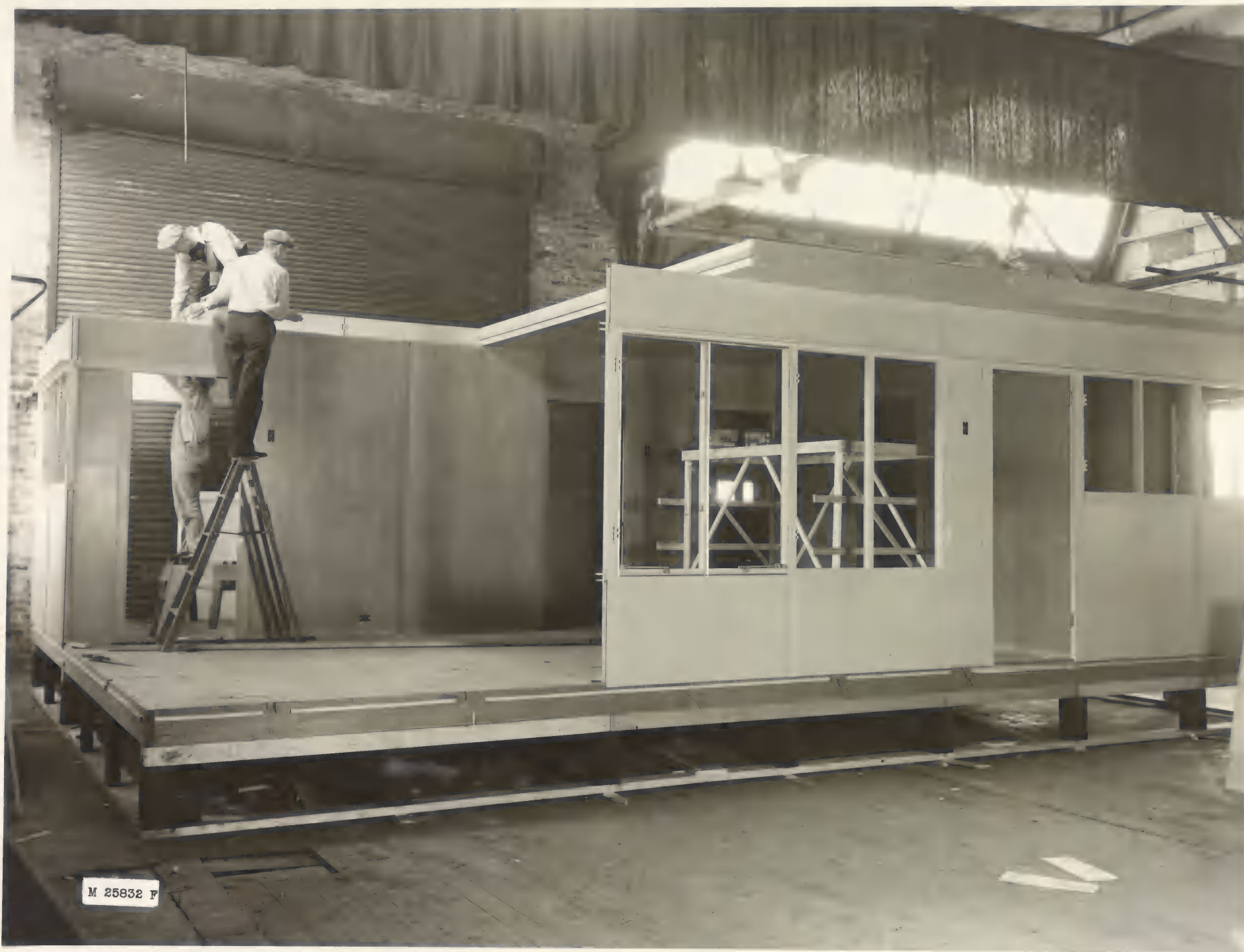


M 25829 F

Placing an interior partition panel. The vertical mullion between the outside wall panels at this junction has a projecting flange that fits into the partition panel. Note the strip attached to the floor panels at the partition line to fit up into the panel.



Placing the first roof panel after 3-1/2 hours. The roof panels are provided with strips on the bottom that fit down into the wall and partition panels.



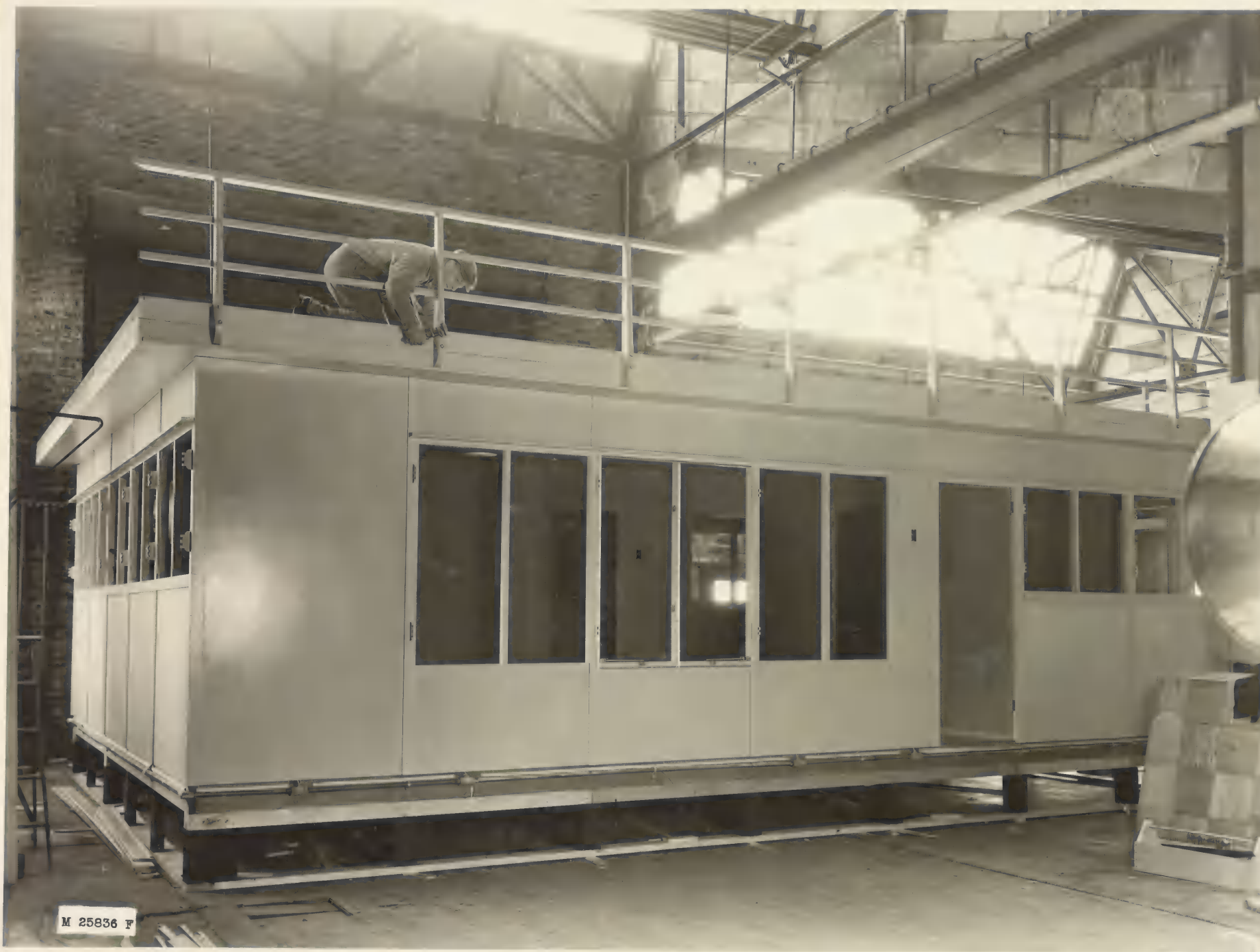
At the end of 5-1/2 hours.



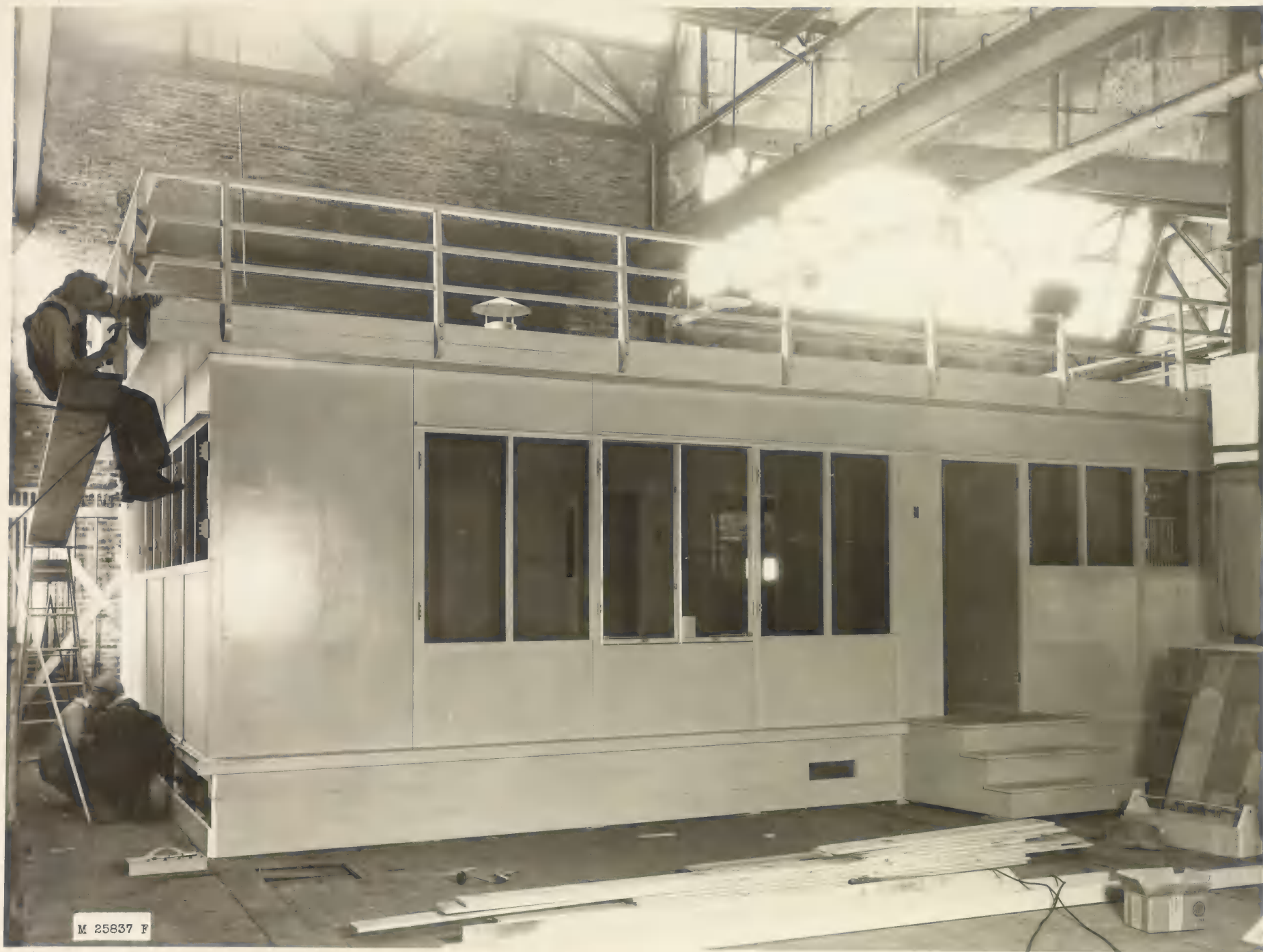
Bringing a window panel up tight with a clamp. Note electric wiring projecting from this panel. All panels were wired for electrical outlets when manufactured.



Placing the last wall panel at the end of 7 hours.



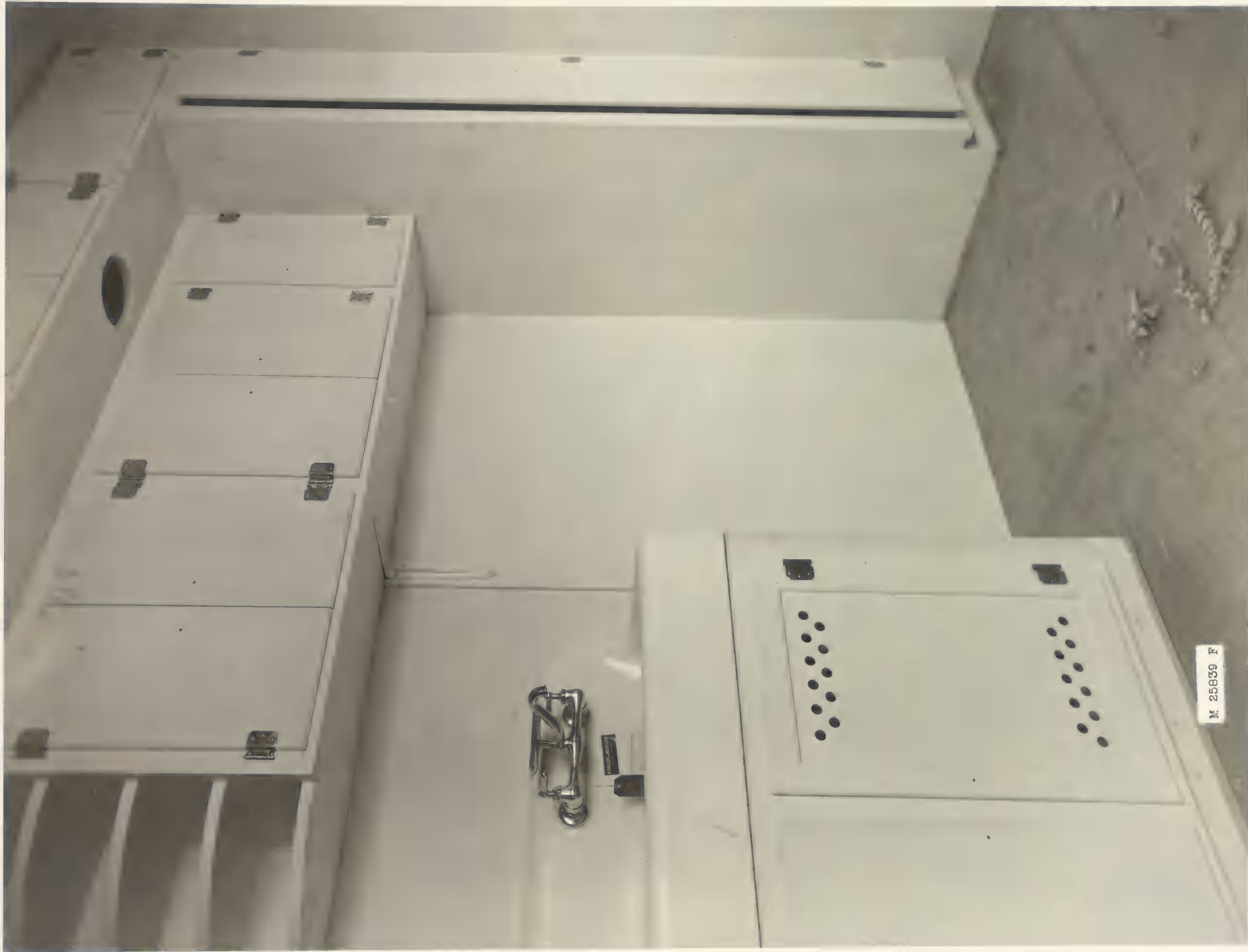
Note the external conduit for picking up all wiring in outside walls. Conduit is also provided under the house to pick up wiring in partitions.



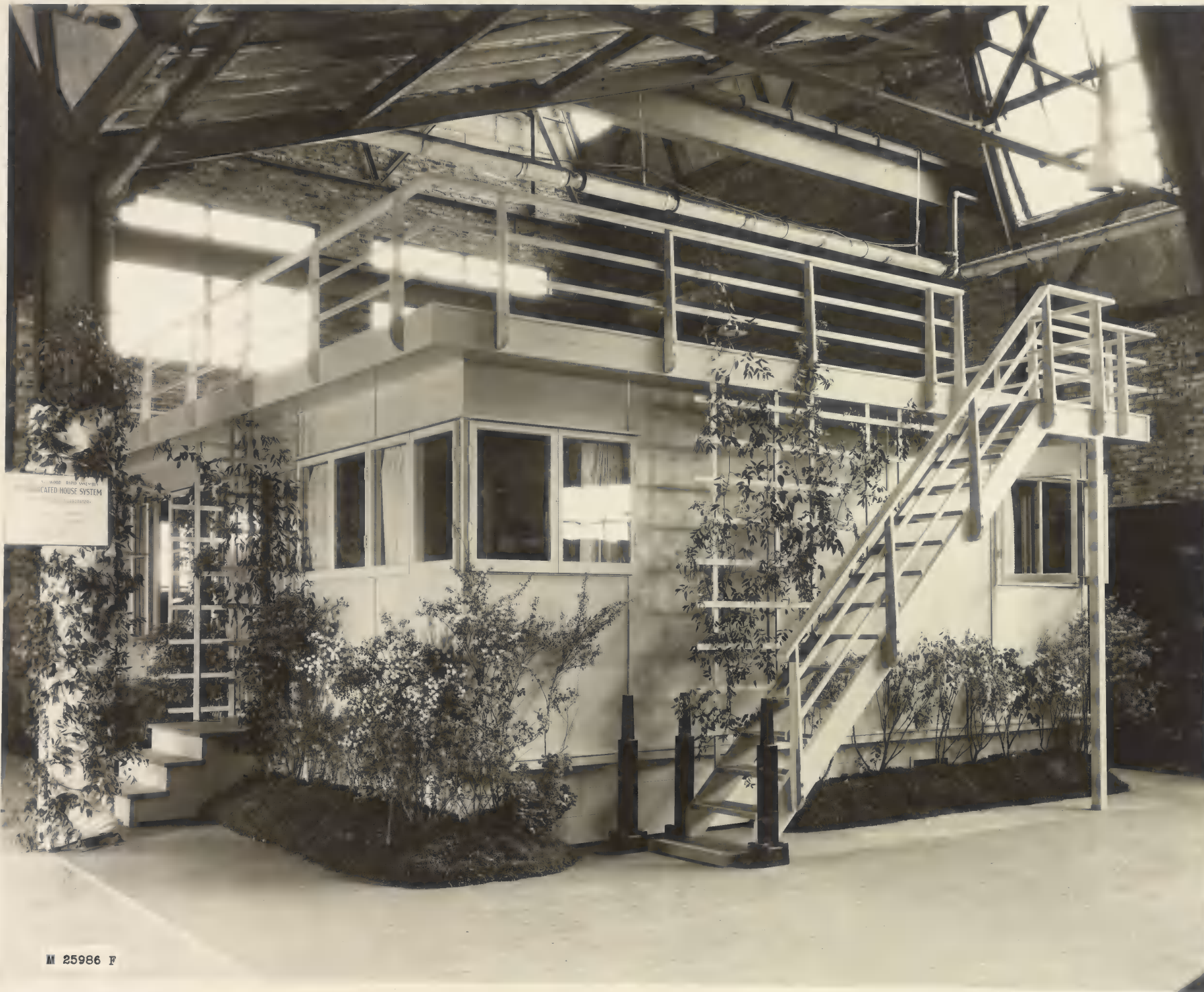
The water table conceals and protects the external conduit.



After 12 hours the finished floors are being laid in 4-foot squares. They are held down by T-shaped parting strips. Wood plugs conceal the screws in these parting strips.

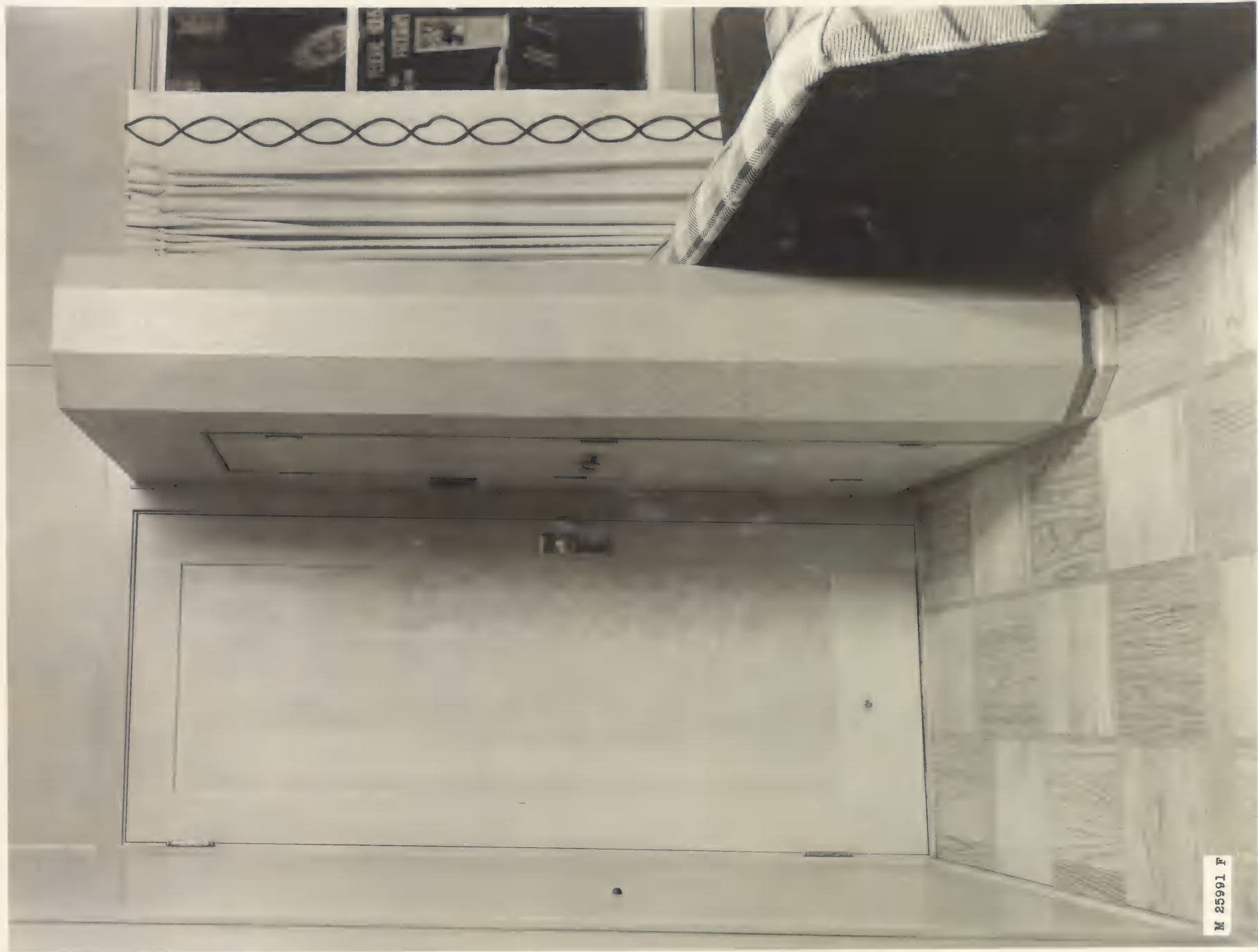


Kitchen cabinets made in the shop are readily placed and secured. The hole in the bottom of the upper cabinet is for a light immediately over the stove and ice box. A similar light is provided over the sink.



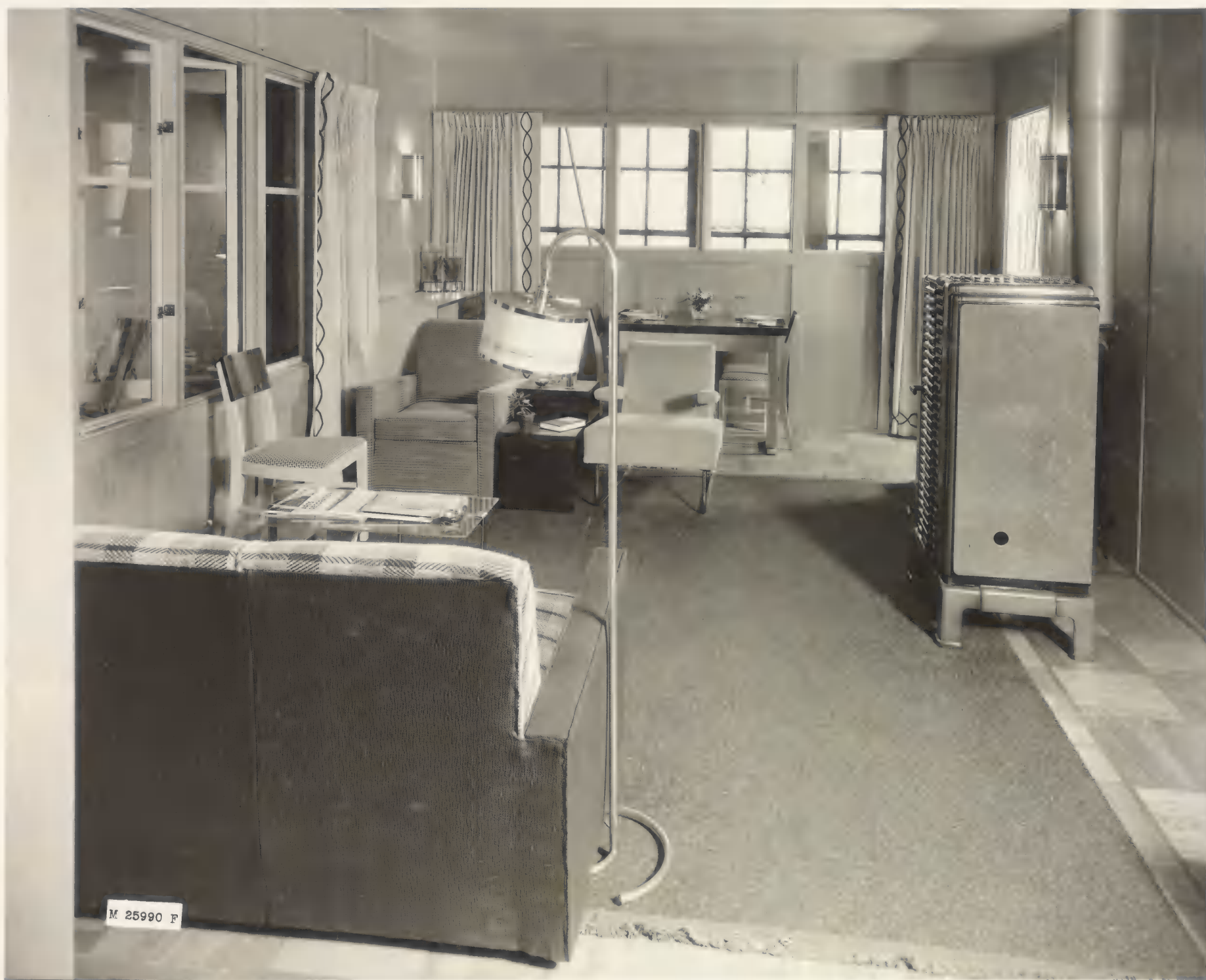
M 25986 F

The house was completely erected by 7 men in 21 hours.



Looking toward front entrance. A factory-built coat closet provides a small vestibule





Glancing to the left as we enter the living room.





The front bedroom is furnished for children.



Showing the prefabricated wardrobe in the children's room.



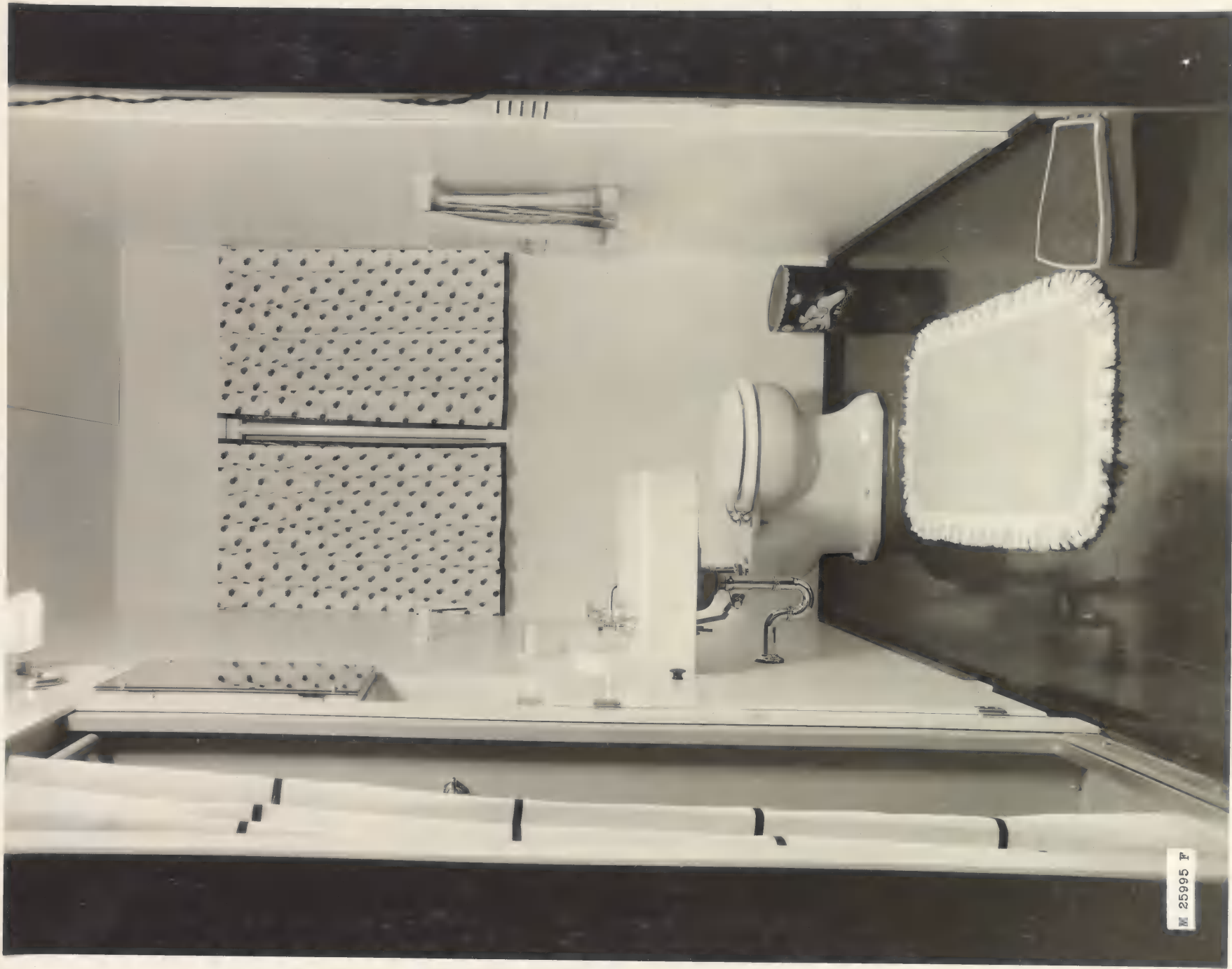
Looking back toward the front entrance and children's room.



The master bedroom.

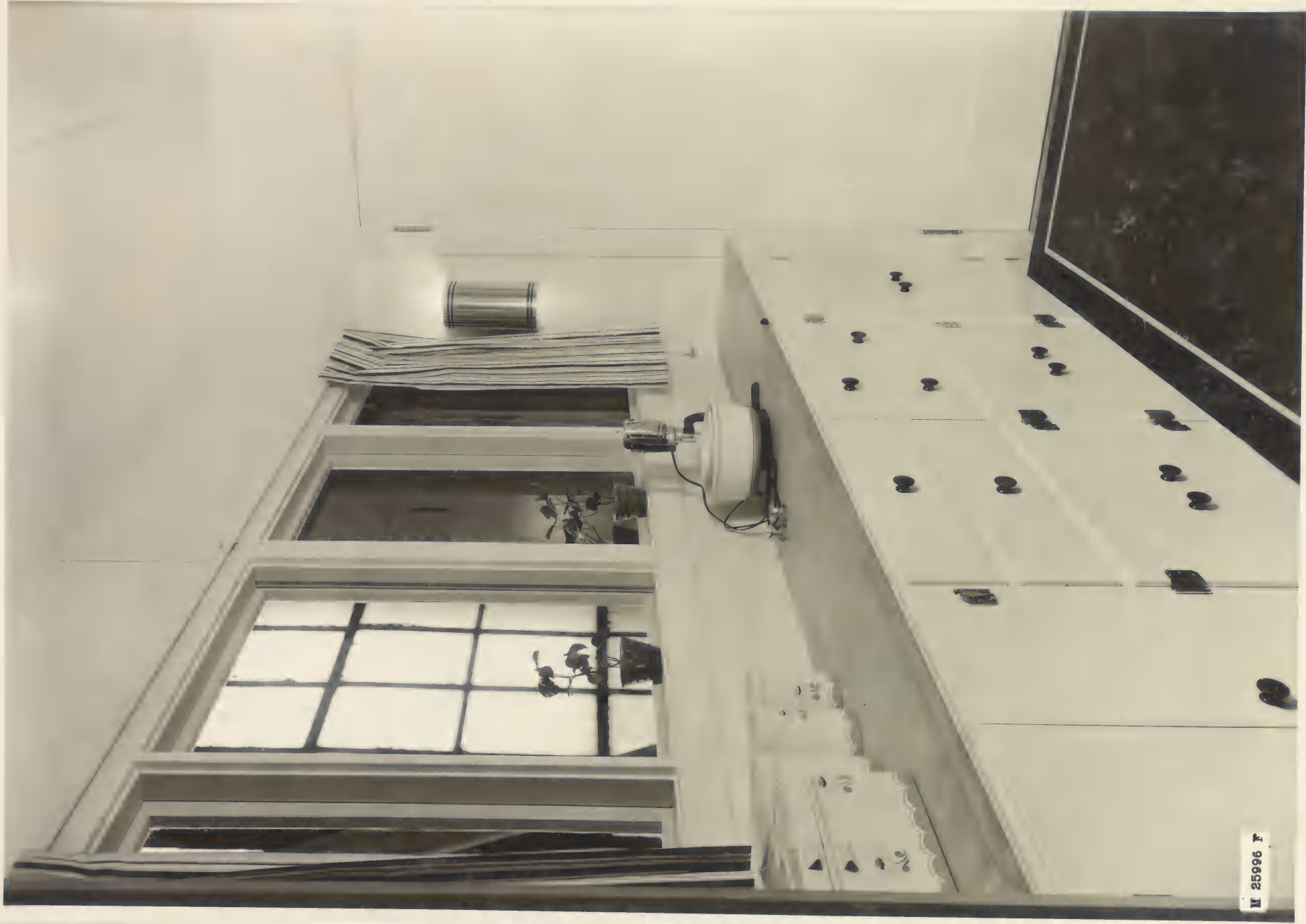


A built-in dressing table adjacent to the wardrobe in the master bedroom.



The bathroom floor is made of the new wood plastic
now under development at the Laboratory.





Looking to the left as we enter the kitchen. A well-lighted workboard of natural birch over commodious drawers and shelves.





A glance to the right in the kitchen.



View of kitchen and dining end of the living room.



Over twelve thousand people inspected the house during the Madison Home and Food Show.

DIAGRAM SHOWING OVERALL DIMENSIONS OF FOREST PRODUCTS LABORATORY PREFABRICATED HOUSE

HEIGHT DIMENSIONS

TO TOP OF ROOF IS 10'-9½"

TO TOP OF RAILING IS 13'-2"

